General

Guideline Title

Final recommendation statement: preeclampsia: screening.

Bibliographic Source(s)

Final recommendation statement: preeclampsia: screening. [internet]. Rockville (MD): U.S. Preventive Services Task Force (USPSTF); 2017 Apr [7 p]. [32 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force. Guide to clinical preventive services. 2nd ed. Baltimore (MD): Williams & Wilkins; 1996. Chapter 37, Screening for preeclampsia. p. 419-424. [32 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the Levels of Certainty regarding Net Benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Summary of Recommendation and Evidence

The USPSTF recommends screening for preeclampsia in pregnant women with blood pressure measurements throughout pregnancy (B recommendation).

Clinical Considerations

Patient Population under Consideration

This recommendation applies to pregnant women without a known diagnosis of preeclampsia or hypertension.

Assessment of Risk

All pregnant women are at risk for preeclampsia and should be screened. Important clinical conditions associated with increased risk for preeclampsia include a history of eclampsia or preeclampsia (particularly early-onset preeclampsia), a previous adverse pregnancy outcome, maternal comorbid conditions (including type 1 or 2 diabetes prior to pregnancy, gestational diabetes, chronic hypertension, renal disease, and

autoimmune diseases), and multifetal gestation. Other risk factors include nulliparity, obesity, African American race, low socioeconomic status, and advanced maternal age.

In the United States, preeclampsia is more prevalent among African American women than among white women. Differences in prevalence may be, in part, due to African American women being disproportionally affected by risk factors for preeclampsia. African American women have case fatality rates related to preeclampsia 3 times higher than rates among white women (73.5 vs. 27.4 per 100,000 cases). Higher prevalence and case fatality rates factor in to why African American women are 3 times more likely to die of preeclampsia than white women. Inequalities in access to adequate prenatal care may contribute to poor outcomes associated with preeclampsia in African American women.

Screening Tests

Blood pressure measurements are routinely used as a screening tool for preeclampsia. The accuracy of blood pressure measurements has been well established. Sphygmomanometry is the recommended method for blood pressure measurement during pregnancy. The patient should be relaxed prior to measurement. After 5 minutes has elapsed, the patient's blood pressure should be read while she is in a sitting position, with her legs uncrossed and her back supported. The patient's arm should be at the level of the right atrium of the heart. If the patient's upper arm circumference is 33 cm or greater, a large blood pressure cuff should be used. Clinicians should avoid measuring blood pressure in the upper arm in the left lateral position because this position falsely lowers blood pressure readings.

Evidence does not support point-of-care urine testing to screen for preeclampsia, as evidence suggests that proteinuria alone may not be a good predictor of preeclampsia health outcomes. Proteinuria measurement is used in the diagnostic criteria for preeclampsia.

Recently revised criteria for the diagnosis of preeclampsia include elevated blood pressure (≥140/90 mm Hg on 2 occasions 4 hours apart, after 20 weeks of gestation) and either proteinuria (≥300 mg/dL on a 24-hour urine protein test, protein to creatinine ratio of ≥0.3 mg/mmol, or urine protein dipstick reading >1 if quantitative analysis is not available) or, in the absence of proteinuria, thrombocytopenia, renal insufficiency, impaired liver function, pulmonary edema, or cerebral or visual symptoms.

Screening Interval

Blood pressure measurements should be obtained during each prenatal care visit throughout pregnancy. If a patient has an elevated blood pressure reading, the reading should be confirmed with repeated measurements. Further diagnostic evaluation and clinical monitoring are indicated for patients with elevated blood pressure on multiple measurements.

Treatment

Management strategies for diagnosed preeclampsia include close fetal and maternal monitoring, antihypertension medications, and magnesium sulfate.

Additional Approaches to Prevention

The USPSTF recommends the use of low-dose aspirin (81 mg/d) as preventive medication after 12 weeks of gestation in women who are at high risk for preeclampsia.

Definitions

What the United States Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.

Grade	Definition	Suggestions for Practice
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read the "Clinical Considerations" section of the USPSTF Recommendation Statement (see the "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The U.S. Preventive Services Task Force defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Preeclampsia
- Pregnancy

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Family Practice

Internal Medicine

Obstetrics and Gynecology

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To update the 1996 U.S. Preventive Services Task Force (USPSTF) recommendation on screening for preeclampsia

Target Population

Pregnant women without a known diagnosis of preeclampsia or hypertension

Interventions and Practices Considered

Screening for preeclampsia using blood pressure measurements and/or urine protein tests throughout pregnancy

Major Outcomes Considered

- Key Question 1: How effectively does screening for preeclampsia reduce maternal and perinatal morbidity and mortality?
    a. Does effectiveness differ by screening protocol (e.g., tests used, timing of tests, rescreen intervals) or preeclampsia risk status?
- Key Question 2: What is the effectiveness of risk assessment in early pregnancy for identifying women at high risk for preeclampsia?
- Key Question 3: What are the harms of preeclampsia risk assessment?
- Key Question 4: How effectively do screening tests (e.g., blood pressure, proteinuria) identify women with preeclampsia?
    a. How accurate are different screening tests for proteinuria?
    b. How effective are different screening protocols (e.g., instruments, test procedures, timing of tests, rescreen intervals) for identifying women with preeclampsia?
    c. How should women at high risk for preeclampsia be screened differently from women at low or average risk?
- Key Question 5: What are the harms of screening for preeclampsia and do they differ by risk status or screening protocol?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Kaiser Permanente Research Affiliates Evidence-Based Practice Center (EPC) for use by the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Sources and Searches

After an initial search for existing systematic reviews and guidelines, a comprehensive search was performed for primary literature in the MEDLINE, PubMed, and Cochrane Central Register of Controlled Trials databases from 1990 through September 1, 2015 (see the eMethods in the systematic review supplement). Studies published before 1990 were excluded because of changes in diagnostic criteria and treatments in the past 25 years, limiting applicability of earlier evidence. Reference lists of prior reports and publications were also searched. Since September 2015, the systematic review authors continued to conduct ongoing surveillance through article alerts and targeted searches of high-impact journals to identify major studies published in the interim that may affect the conclusions or understanding of the evidence and therefore the related U.S. Preventive Services Task Force (USPSTF) recommendation. The last surveillance was conducted on October 5, 2016, and identified no relevant new studies.

Study Selection

Two investigators independently reviewed 10,082 titles and abstracts and 378 full-text articles against prespecified inclusion criteria (see Figure 2 in the systematic review). Discrepancies were resolved through consensus discussions. English-language, fair- and good-quality studies of pregnant women and adolescents without a diagnosis of preeclampsia and asymptomatic for the condition were included. Studies among women with chronic hypertension, diabetes mellitus, or elevated risk for preeclampsia were also included. Studies were excluded if they solely focused on women seeking high-risk obstetric care, receiving infertility treatment, receiving inpatient care, or if they were conducted in countries not having a high development index designation according to the 2014 United Nations Development Programme. Any standard diagnostic criterion for preeclampsia was allowed.

Screening interventions included point-of-care tests and clinical tools routinely used in prenatal care to screen for preeclampsia, such as blood pressure measurements using manual or automated devices and point-of-care urine tests for proteinuria with qualitative, quantitative, visual, or automated readings. Only studies using the 24-hour urine test as the reference standard to calculate the diagnostic accuracy of urine protein tests were included. Secondary evaluations and tests used to assess preeclampsia severity or to confirm diagnosis were not included. Evidence on the benefits and harms (Key Question [KQ] 1, KQ5) of preeclampsia screening was from randomized clinical trials (RCTs) and observational studies that reported on maternal and infant mortality, morbidity from eclampsia, HELLP (hemolysis, elevated liver enzyme levels, low platelet counts) syndrome, organ damage or failure, fetal growth restriction, preterm delivery, low birth weight, stillbirth, and placental abruption. Evidence was sought on the screening test performance of clinical blood pressure measurement, urinalysis, or both for identifying women with preeclampsia at the time of screening (KQ4), to compare the effectiveness of different screening protocols (e.g., instruments, test procedures, timing of tests, rescreen intervals) (KQ4a), to assess the diagnostic accuracy of point-of-care tests for detecting proteinuria (KQ4b), and to evaluate risk-based screening protocols, compared with general screening (KQ4c).

For assessment of preeclampsia risk (KQ2, KQ3), studies evaluating prediction models for use in the first 20 weeks of pregnancy were included to inform and differentiate screening and preventive interventions (e.g., aspirin prophylaxis) before preeclampsia develops. These were externally validated (i.e., models tested in another population than the derivation study, assessing either performance or effect) multivariable risk prediction models using patient history and routinely collected clinical measures (e.g., body mass index, weight, blood pressure) as well as serum markers and Doppler ultrasound measures (e.g., uterine artery pulsatility index).

Number of Source Documents

See the literature flow diagram (Figure 2) in the systematic review (see the "Availability of Companion Documents" field) for a summary of evidence search and selection.

Articles included for Key Questions:

- Key Question 1: 0 articles
- Key Question 1a: 1 article (1 study)
- Key Question 2: 18 articles (4 studies)
- Key Question 3: 1 article (1 study)
- Key Question 4: 0 articles
- Key Question 4a: 14 articles (14 studies)
- Key Question 4b: 0 articles
- Key Question 4c: 0 articles
- Key Question 5: 2 articles (2 studies)

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Two investigators independently assessed the quality of all included studies using criteria predefined by the U.S. Preventive Services Task Force (USPSTF) and supplemented them with other criteria from the Quality Assessment of Diagnostic Accuracy II for diagnostic accuracy studies (KQ4a) and from the Newcastle-Ottawa Scale and Before-After Quality Assessment Tool for observational studies (KQ3 and KQ5) (see eTable 1 in the systematic review supplement [see the "Availability of Companion Documents" field]). Each included study received a final quality rating of good, fair, or poor; discrepancies were resolved through discussion.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Kaiser Permanente Research Affiliates Evidence-Based Practice Center (EPC) for use by the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Quality Assessment and Data Extraction

Two investigators independently assessed the quality of all included studies using criteria predefined by the USPSTF and supplemented them with other criteria from the Quality Assessment of Diagnostic Accuracy II for diagnostic accuracy studies (KQ4a) and from the Newcastle-Ottawa Scale and Before-After Quality Assessment Tool for observational studies (KQ3 and KQ5) (see eTable 1 in the systematic review supplement). Each included study received a final quality rating of good, fair, or poor; discrepancies were resolved through discussion. Poor-quality studies (i.e., attrition >40%, differential attrition >20%, or other fatal flaws or cumulative effects of multiple minor flaws or missing information significant enough to limit confidence in the validity of results) were excluded. Good-quality studies met all or most of the assessment criteria; fair-quality studies met only some of the assessment criteria.

One investigator abstracted data from all included studies into an Access database (Microsoft Corp). A second investigator checked the data for accuracy.

Data Synthesis and Analysis

Summary evidence tables for each of the key questions include study population characteristics, study design features, and findings. Statistical pooling of results with meta-analysis was not possible for any outcomes because of statistical and clinical heterogeneity due to different study designs, interventions, reference standards, and populations.

Synthesis of included prediction models was informed by methodologic guidance for evaluating performance of multivariable risk prediction models. Model performance was evaluated based on commonly recognized metrics. These include discrimination (*c* statistic), or area under a receiver operating characteristic curve plot, representing the probability that a case will have a higher risk score than a noncase. Sensitivity, specificity, positive predictive values (PPVs), and negative predictive values also measure discrimination. A priori risk-level cutpoints are optimal, but in the preeclampsia prediction literature "detection rates," analogous to sensitivity, were commonly reported, with risk cutpoints corresponding to a 10% false-positive rate (90% specificity). Calibration reflects the extent to which the model predictions match the observed outcomes for individuals across different risk levels; goodness-of-fit tests (e.g., Hosmer-Lemeshow test) are sometimes reported, but calibration plots that graphically depict the observed outcome frequencies against predicted probabilities are more informative. Discrimination and calibration are both necessary for evaluating model performance in validation studies. The models the guideline authors identified with good or better discrimination based on the c statistic (≥0.80) are described in this review. Models were classified as to whether they aimed to predict preeclampsia requiring early delivery (<34 weeks' gestation) or a later-onset diagnosis (≥34 weeks' gestation)

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	**Magnitude of Net Benefit**			
	Substantial	**Moderate**	**Small**	**Zero/Negative**
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

**A*, *B*, *C*, *D*, and *I (Insufficient)* represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field.

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence, the USPSTF constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?

6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the USPSTF process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term *certainty* will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see the "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147(12):871-875. [5 references].

Rating Scheme for the Strength of the Recommendations

What the United States Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I	The USPSTF concludes that the current evidence is	Read the "Clinical Considerations" section of the USPSTF

Grade	Definition	Suggestions for Practice
Statement	insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Recommendation Statement (see the "Major Recommendations" field). If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The U.S. Preventive Services Task Force defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Cost Analysis

The U.S. Preventive Services Task Force (USPSTF) does not consider the costs of providing a service in this assessment.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review

Before the U.S. Preventive Services Task Force (USPSTF) makes its final determinations about recommendations on a given preventive service, the Evidence-based Practice Center and the Agency for Healthcare Research and Quality send the draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. The draft evidence review is

also posted on the USPSTF Web site for public comment. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the USPSTF Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF website from September 27 to October 24, 2016. Some comments requested elaboration on the urine protein dipstick test. In response, the USPSTF addressed testing for proteinuria in the Clinical Considerations and Rationale sections. Some comments requested more information on screening intervals, which is provided in the Clinical Considerations. Other comments requested clarification about risk prediction of preeclampsia. In response, the USPSTF added information about risk prediction models to the Rationale and Discussion sections.

Recommendations of Others

Recommendations for screening from the following groups were considered: the Society of Obstetricians and Gynaecologists of Canada, the National Institute for Health and Care Excellence, and the American College of Obstetricians and Gynecologists.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendation is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Early Detection and Treatment

Preeclampsia is a complex syndrome. It can quickly evolve into a severe disease that can result in serious, even fatal health outcomes for the mother and infant. The ability to screen for preeclampsia using blood pressure measurements is important to identify and effectively treat a potentially unpredictable and fatal condition. The U.S. Preventive Services Task Force (USPSTF) found adequate evidence that the well-established treatments of preeclampsia result in a substantial benefit for the mother and infant by reducing maternal and perinatal morbidity and mortality.

The USPSTF found inadequate evidence on the effectiveness of risk prediction tools (e.g., clinical indicators, serum markers, or uterine artery pulsatility index) that would support different screening strategies for predicting preeclampsia.

Potential Harms

Harms of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found adequate evidence to bound the potential harms of screening for and treatment of preeclampsia as no greater than small. This assessment was based on the known harms of treatment with antihypertension medications, induced labor, and magnesium sulfate; the likely few harms from screening with blood pressure measurements; and the potential poor maternal and perinatal outcomes resulting from severe untreated preeclampsia and eclampsia. The USPSTF found inadequate evidence on the harms of risk prediction.

Qualifying Statements

Qualifying Statements

- The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without obvious related signs or symptoms.
- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.
- Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality (AHRQ) or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the USPSTF will make all its products available through its Web site. The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size *Guide to Clinical Preventive Services*.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Final recommendation statement: preeclampsia: screening. [internet]. Rockville (MD): U.S. Preventive Services Task Force (USPSTF); 2017 Apr [7 p]. [32 references]

Adaptation

Not applicable: The guideline is not adapted from another source.

Date Released

2017 Apr

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services or its agencies.

Source(s) of Funding

The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality (AHRQ) support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

Composition of Group That Authored the Guideline

*Task Force Members**: Kirsten Bibbins-Domingo, PhD, MD, MAS (University of California, San Francisco); David C. Grossman, MD, MPH (Kaiser Permanente Washington Health Research Institute, Seattle); Susan J. Curry, PhD (University of Iowa, Iowa City); Michael J. Barry, MD (Harvard Medical School, Boston, Massachusetts); Karina W. Davidson, PhD, MASc (Columbia University, New York, New York); Chyke A. Doubeni, MD, MPH (University of Pennsylvania, Philadelphia); John W. Epling Jr, MD, MSEd (Virginia Tech Carilion School of Medicine, Roanoke); Alex R. Kemper, MD, MPH, MS (Duke University, Durham, North Carolina); Alex H. Krist, MD, MPH (Fairfax Family Practice Residency, Fairfax, Virginia, Virginia Commonwealth University, Richmond); Ann E. Kurth, PhD, RN, MSN, MPH (Yale University, New Haven, Connecticut); C. Seth Landefeld, MD (University of Alabama at Birmingham); Carol M. Mangione, MD, MSPH (University of California, Los Angeles); William R. Phillips, MD, MPH (University of Washington, Seattle); Maureen G. Phipps, MD, MPH (Brown University, Providence, Rhode Island); Michael Silverstein, MD, MPH (Boston University, Boston, Massachusetts); Melissa A. Simon, MD, MPH (Northwestern University, Evanston, Illinois); Chien-Wen Tseng, MD, MPH, MSEE (University of Hawaii, Honolulu, Pacific Health Research and Education Institute, Honolulu, Hawaii)

*Members of the Task Force at the time this recommendation was finalized. For a list of current Task Force members, go to https://www.uspreventiveservicestaskforce.org/Page/Name/our-members.

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force (USPSTF) has an explicit policy concerning conflict of interest. All members disclose at each meeting if they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. USPSTF members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

Conflict of Interest Disclosures

All authors have completed and submitted the International Committee of Medical Journal Editors (ICMJE) Form for Disclosure of Potential Conflicts of Interest. Authors followed the policy regarding conflicts of interest described at https://www.uspreventiveservicestaskforce.org/Page/Name/conflict-of-interest-disclosures. All members of the USPSTF receive travel reimbursement and an honorarium for participating in USPSTF meetings.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force. Guide to clinical preventive services. 2nd ed. Baltimore (MD): Williams & Wilkins; 1996. Chapter 37, Screening for preeclampsia. p. 419-424. [32 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Henderson JT, Thompson JH, Burda BU, Cantor A. Preeclampsia screening: evidence report and systematic review for the U.S. Preventive Services Task Force. JAMA. 2017 Apr 25;317(16):1668-83.
- Henderson JT, Thompson JH, Burda BU, Cantor A, Beil T, Whitlock EP. Screening for preeclampsia: a systematic evidence review for the U.S. Preventive Services Task Force. Evidence Synthesis No. 148. Publication No. 14-05211-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2017 Apr. 138 p.

Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

The following are also available:

- Screening for preeclampsia: clinical summary. Rockville (MD): U.S. Preventive Services Task Force; 2017 Apr. 1 p. Available from the USPSTF Web site.
- Fingar KR, Mabry-Hernandez I, Ngo-Metzger Q, Wolff T, Steiner CA, Elixhauser A. Delivery hospitalizations involving preeclampsia and eclampsia, 2005–2014. Related information for health professionals. Rockville (MD): Agency for Healthcare Research and Quality; 2017 Apr. 26 p. Available from the AHRQ Web site.

The Electronic Preventive Services Selector (ePSS) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following is available:

- Screening for preeclampsia during pregnancy. JAMA patient page. JAMA. 2017 Apr 25;317(16):1700.

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the USPSTF and is available at www.healthfinder.gov.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI on June 30, 1998. The information was verified by the guideline developers on December 1, 1998. This summary was updated by ECRI Institute on May 18, 2017. The updated information was verified by the guideline developer on May 22, 2017.

Copyright Statement

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouseâ„¢ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical

practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.